PROPOSALS TO

SEVIER RIVER WATER USERS

## Background

The Sevier River Water Management Study is a four-year general investigation which will study the potential for improving water management through nonstructural alternatives. The study is a joint effort of the Bureau of Reclamation (Reclamation), the Sevier River Water Users Association (SRWUA), Utah Division of Water Resources, Utah Division of Water Rights, Utah State University (USU), Brigham Young University (BYU), and the Central Utah Water Conservancy District (CUWCD). Also participating and/or being consulted are the Soil Conservation Service, U.S. Army Corps of Engineers (Corps), River Forecast Center (RFC), U.S. Geologic Survey (USGS), and the Sanpete County Water Conservation District. The work is being conducted under the direction of Reclamation. Work on the study was begun October 1, 1988.

The objective of the study is to evaluate the potential for assisting with Basin water management through the application of such advanced technologies as real-time communication, computer modeling, satellite imagery, and automation. The recently completed Wasatch Front Total Water Management Study (WFTWMS) identified a need for more accurate and timely distribution of water resource data in the Sevier River Basin.

## Studies Running Contemporary

The following studies are running contemporary with the Sevier River Water Management Study:

1. Sevier River Basin Hydrologic Inventory (nearing completion) - Utah Division of Water Resources;

2. Sevier River Flood Study (1991) - U.S. Army Corps of Engineers;

3. Otter Creek and Piute Reservoir Operations Study (1990-91) - Soil Conservation Service;

4. Cloud Seeding Enhancement of Streamflow in Sevier River Basin (1990-91) - research project of Reclamation; and

5. Basinwide Evaluation of SNOTEL Sites (1990?) - Soil Conservation Service.

## Basinwide Proposals

### Needs

As identified in WFTWMS, the basic needs of the Sevier River Basin are:

1. Installation of a system to accelerate data collection (streamflows, reservoir storage, water quality, weather, ground water, etc.);

2. Installation of a system to accelerate the sending of data to water managers, aided by a system of computer graphics to facilitate data interpretation;

3. Evaluation and development of models to assist decision makers with water accounting and operation;

4. Improvement in runoff forecasts using data acquired from LANDSAT, GOES, etc. and integration of information into Basin operation models; and

5. Evaluation of the cost-effectiveness of automating existing facilities.

These needs will provide the main thrust of the Sevier River Water Management Study.

One deterrents to improved water management within the basin is that each irrigator or irrigation company sees only his own diversion and its effects. A system which would allow each interested party to review his situation on a daily basis, rather than waiting for a commissioner's report (which is not published until the subsequent year), would allow for more efficient water management and reduce water user frustrations.

### Work Accomplished to Date

A unified data-base for all real-time data has been established at Utah State University. This data-base includes: (a) streamgaging stations, (b) meteorlogical data, including forecasts), (c) water quality, etc.

### Proposed Work

The following work is proposed for the Sevier River Basin as a whole:

1. Develop computer software for use by water users including: (a) communication software to download data from downlink to PCs in Basin and (b) data interpretation software, including time-series plots and mapping routines (USU in 1990);
2. Develop computer software to assist river commissioners with daily water rights allocations (USU, Division of Water Rights, SRWUA in 1990); and
3. Develop software to provide water users with better and more timely streamflow forecasts (BYU in 1990-92).

## Lower Sevier River Proposals

### Needs

The lower Sevier River Basin has a need for models to assist with decisions related to salinity management. Although salinity is a problem to irrigators above Sevier Bridge Reservoir, their soils are usually well drained so leaching is not a problem. Below the reservoir the situation is different. The release from Sevier Bridge Reservoir is characterized by a salt content of 1,500 mg/L. Below Gunnison Bend Reservoir, the salinity is routinely over 3,000 mg/L. To deal with these salinity problems the lower Basin water users have several options including: (1) flushing the lower reservoirs (DMAD and Gunnison Bend); (2) pumping from a series of 9 ground water wells located along the river near Lynndyl; (3) sweetening Sevier Bridge Reservoir with import water (once the Central Utah Project is complete); etc. Since each of these options has liabilities, what is needed is a model to monitor the situation and evaluate hydrosalinity options.

### Work Accomplished to Date

Eight streamgaging and reservoir stations have been upgraded to real-time: Sevier Bridge Reservoir, Sevier River at Juab (outflow from SBR), Sevier River at the head of Leamington Canyon, Central Utah Canal, Sevier River at Lynndyl, Canal A, Sevier River at Delta (outflow from DMAD Reservoir), and Gunnison Bend Reservoir. Salinity probes have been added to three real-time stations: Sevier River at the head of Leamington Canyon, Sevier River at Lynndyl, and Gunnison Bend Reservoir.

Access has been provided to the real-time information through the Lower Sevier River Commissioner's personal computer (PC).

### Proposed Work

The following work is proposed for the Lower Sevier River Basin:

1. Develop a water quality (salinity) model to assist Lower Basin managers in evaluating alternatives for managing salinity in DMAD and Gunnison Bend Reservoirs (Reclamation in 1990); and
2. Develop a system to assist Lower Basin water managers with suggested reservoir releases to maximize crop production and regional economic development (USU and Reclamation in 1991).

## Gunnison Valley Proposals

### Needs

For the three canals which divert from the main stem of the Sevier River (above Sevier Bridge Reservoir), the principal issue is water quality, high levels of salinity can occur during the late irrigation season as the river is increasingly fed by return flow.

For the Gunnison Irrigation Company the principal need is

for better and more timely information on the flows in Twelve-Mile Creek. Since Twelve-Mile Creek is unregulated, the irrigation company adjusts its releases from Gunnison Reservoir (on the Sanpitch River) to accomodate changes in Twelve-Mile. This requires timely information on past, present, and future flows in Twelve Mile.

Work Accomplished to Date

Three streamgaging stations have been upgraded to real-time: Sevier River near Sigurd, Sevier River near Gunnison, and 12-Mile Creek near mouth of canyon. The Utah Division of Water Rights has moved the gaging station on the Sevier River near Gunnison to a better site.

Proposed Work

The following work is proposed for the Gunnison Valley area:

1. Add salinity probe to real-time station at Sevier River near Gunnison (Reclamation in 1990);
2. Evaluate the need for upgrading the snow course at Mt. Baldy to real-time (SCS in 1990); and
3. Develop a model for short-term forecasts (1-5 days) to assist Gunnison Irrigation Company with releases from Gunnison Reservoir and develop communication system to transfer the information to the irrigation company (Reclamation and RFC in 1990).

## Sevier Valley Proposals

Needs

The most significant problem in Sevier Valley is the quantity and timing of water releases from Piute Reservoir to meet irrigation demands. There is a 36-hour lag time from the time water is released from Piute until it reaches the farmer's headgate at the bottom end of the upper stream. If the amount and timing is miscalcuated, the water passes over Vermillion Dam and any further use is lost to Sevier Valley. Also, many variables impact the quantity and timing of reservoir releases, including weather conditions, cropping patterns, holiday schedule, communication, etc.

Work Accomplished to Date

Nine gaging stations and reservoir stations have been upgraded to real-time: Otter Creek Feeder Canal, Otter Creek Reservoir, East Fork Sevier River near Kingston, Sevier River at Kingston, Piute Reservoir, Piute Reservoir outflow, Sevier River above Clear Creek, Clear Creek, and Sevier River near Richfield (Vermillion).

Access has been provided to the real-time data base through the Upper Sevier River Commissioner's PC.

Proposed Work

The following work is proposed for the Sevier Valley area:

1. Evaluate management and minor structural alternatives for leveling out the flow of the Sevier River below Clear Creek (USU and Reclamation in 1991);
2. Develop a prototype real-time (LOS radio) to monitor

river diversions between Clear Creek and Vermillion Dam; (USU, Reclamation, and Utah Division of Water Resources in 1991-92); and.

3. Develop a computer model to assist the Upper Sevier River Commissioner with reservoir operations (Utah Division of Water Resources in 1990-91)

## Sanpete Valley Proposals

### Needs

The needs in Sanpete County have been studied by the Sanpete County Water Conservancy District. An additional 10 conventional gaging stations are required.

### Work Accomplished to Date

A real-time weather station has been installed at Ephraim. Access has been provided to the real-time data base through the Lower Sanpitch River Commissioner's PC.

Work has been initiated by the Sanpete County Water Conservancy District to install 8 conventional gaging stations.

### Proposed Work

The following work is proposed for Sanpete Valley: evaluate the need for real-time stream gaging stations in the Sanpitch drainage (SCWCD in 1990).

## Upper Sevier Proposals

### Needs

(Currently being developed)

### Work Accomplished to Date

A real-time weather station has been installed at Panquitch.

### Proposed Work

(Currently being developed)